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Posture but that of leaning forwards on her Breast. I am, with all Respect,

S I R,

March 10. 1744.

Your most obedient

Humble Servant,

Ch. Jernegan.

The left Kidney, being longer than usual, was examined and found to have two Ureters; and each had its separate *Pelvis*.

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XVIII. Regiæ Societati *Anglicanæ* Scientiarum quædam Electricitatis recens observata exhibet Jo. Henricus Winkler, Gr. & Lat. Literarum Prof. Publ. Ordin. & Academiæ *Lipfisensis* h. t. Rector.

I.

*Tritu excitatæ Electricitatis Genera.*

Presented March 21. 1744-5.

§ 1. **V**ITREI caviq[ue] globi, & vitrea vasa, quæ facta rotatione applicataque iis manu teruntur, in sibi vicinis metallis atque hominibus eam electricitatem excitant, ut scintillæ electricæ, quæ accedente corpore electricitatis vacuo eliciuntur, fluminis instar continuatæ prorumpant.

§ 2. Si vero tubi & vasa vitrea ita teruntur, ut itum reditumque subeant, excitata inde in metallis & hominibus electricitate, oriundæ scintillæ per intervalla profiliunt.

§ 3. Ad tubos commode terendos machinam parari curavi, quam TAB. III. *Fig. 2.* repræsentat.

Tabulæ *a b c d* quatuor columnæ inferuntur. Mediarum *e* & *f* capitibus *g* & *h* ope cochlearum afferculi affiguntur, quorum pars media ita cavata est, ut convexitati tubi vitrei congruat. Cum his afferculis alii ejusdem generis afferculi pariter cavati vi cochlearum junguntur. Columnam ejusmodi cum impositis junctisque afferculis *Fig. 3* exhibet, ubi *ik* afferculum inferiorem, & *lm* afferculum superiorem, & *no* cochleas firmantes ostendit. Superioris & inferioris afferculi cavaturæ, corio cervino subjectisque crinibus obductæ & vestitæ ita congruunt, ut tubum vitreum, qui hinc inde trahi potest, arcte complectantur. Tubi vitrei extremitates *q q* capsulis ex aurichalco paratis induntur, firmanturque maltha factitia.

Capsulis annuli annexi sunt, quibus illigantur funes cannabini, quorum alter *q r* per foramen columnæ *t u*, alterque *q s* super trochleam  $\alpha$  columnæ *y z* affixam protenditur. His ita constitutis, tubus vitreus, quando a duobus hominibus ultro citroque trahitur, excitatam in se tritu electricitatem cum tubo ex lamina ferrea confecto  $\alpha \beta$  & in retibus sericis collocato large communicat. Tubi ferrei extremitati  $\alpha$  fila argentea alligantur, quæ tubum vitreum inter duas columnas *eg* & *fb* attingunt.

§ 4. Quamvis vero scintillæ globo vitreo rotato excitatæ in metallorum superficiebus continuo fluant; cæ tamen, quæ a vasis vitreis itum reditumque inter

terendum subeuntibus proficiscuntur vehementius pungunt, si vasa eandem, quam globi magnitudinem habent, paremque materiæ vitreæ bonitatem.

§ 5. Porro scintillæ electricæ, quæ tractis tritisque tubis vitreis in metallorum superficiebus suscitantur, pungendi virtute superant scintillas excitatas vasis vitreis, quæ more tornatorum teruntur.

§ 6. Globi vitrei manu applicata inter rotandum triti plus electricitatis exhibent, quam adhibito pulvinari corio vestito.

§ 7. In experimentis, quæ aut globo rotato, aut tubo tracto instituuntur, tribus hominibus opus est. Adhibita vero machina tornatoria, sufficit unus.

## II.

### *Electricitatis augendæ Ratio.*

§ 8. **U**NO vel vase, vel globo, vel tubo vitreo excitata electricitas, mihi simplex vocatur. Fit duplex, duobus vel vasis, vel globis, vel tubis tritis; triplex tribus; quadruplex quatuor, & ita porro.

§ 9. Quam excitavi electricitatem tritu duorum globorum vitreorum, quorum diameter est pes dimidius *Parisinus*, tanta fuit in aqua, in nive, in glacie, ut prorumpentes ex his corporibus scintillæ electricæ spiritum vini purum calefactumque inflammarent.

In aqua experimentum dupliciter capitur. Vel enim spongiæ aqua impletæ, atque ex lamina ferrea in speciem tubi conformata & electricitatem nanciscente pendentis, spiritus in parvo cochleari adhibetur: vel digitus spiritu vini calefacto madidus super aquam in vase stanneo extenditur, certo tamen inter aquæ superficiem

superficiem & digitum interjecto intervallo. Vasi, serico reti imposito, adjungitur filum ferreum, quod ad globum aut tubum aut vas vitreum in machina electricitatis pertingit. Nix & glacies itidem in vase stanneo reti serico imponuntur.

§ 10. Ut electricitas adhuc major existat, duæ machinæ ita collocantur, ut quælibet duos habeat globos, qui electricitatem cum uno eodemque tubo ferreo communicant. Quod quomodo efficiatur, TAB. III. Fig. 1. significat. Cuivis machinæ apponitur rete sericum *ab*, quocum tubus ferreus *cd* conjunctus est, qui prope utramque machinam duo brachia ferrea *bc* & *ef* atque *bd* & *gh* porrigit, quibus annexa sunt fila argentea, quæ globos in locis *iklm* attingunt.

Si loca globorum vasa vitrea occupant, quæ applicatis pulvinaribus teruntur more tornatorum agitata: brachiis ferreis nulla adjungo fila argentea, quæ vasa attingant. His enim ita adjunctis electricitatem minorem existere deprehendi.

### III.

*Electricitas, quando ex Tubo ferreo in Corpus, ex quo primitus orta est, redit, imminuitur.*

§ 11. **E**Xperimentum sequenti ratione instituitur. Machina cum vase vitreo, & homo, qui more tornatorum calcando vas vitreum agit, insistant retibus sericis adeo amplis, ut & machinæ & hominis calcantis pedes a lateribus ligneis, quibus retia alligata sunt, longissime distent.

§ 12. Quando vas vitreum agitaturn pulvinari atteritur, non solum tubus ferreus in reti positus vasi- que proximus, sed homo etiam & machina electrici- tatem certam produnt, qua in orbe vitreo, quem alius homo, in reti serico non insistens, manu tenet, sub- jecta corpuscula leviora varie commoventur.

§ 13. Idem fit, si loco vasis globus adhibetur; & homo, qui ipsi manum inter rotandum applicat, uno pede machinæ, alteroque reti serico insistit.

§ 14. Si vero, his omnibus ita constitutis, tubo ferreo *ab* (TAB. III. *Fig.* 10.) in reti serico prope vas vel glo- bum vitreum collocato alius *cd* adjungitur ita exten- sus, ut machinam v. c. in loco *e* attingat; scintillæ, quæ ante excitari poterant, desinunt, ipsaque vis at- trahendi quam maxime imminuitur.

## IV.

*Electricitas in vacuo.*

§ 15. **M**Achina, cujus ope electricitas in spatio vacuo commode excitari, & per cam- panam vitream in aërem propagari, & cum corpori- bus omnis generis communicari potest, in TAB. III. *Fig.* 6. exhibetur.

Constat vase vitreo *abcd* (*Fig.* 8.), cujus basibus *ac* & *bd* maltha factitia junctæ sunt laminæ ex auri- chalco confectæ, quarum uni *ac* annexum est bra- chium ligneum *ef*. In hoc brachio ligneo alteraque lamina *bd* cavaturæ sunt conoides, quibus axiculi indi- possunt, qui cochleæ formam habentes infixi sunt lateribus sustentaculi metallici *ghiklm*, quod cochlea mare *mn* instructum cochleæ foemellæ in orbe antliæ

pneumaticæ inferi potest. Cochlea mas transit per foramen laminæ curvatæ elasticæ, quæ in *Fig. 9.* describitur. Sustentaculi pedi (*Fig. 7.*) *lm* vi cochleæ affixa est lamina *no*, cujus pars superior *pq* corio cervino subjectisque pilis obducta vasi vitreo adjacet.

Quæ superimponitur, campanæ *abcd* (*Fig. 6.*) infixus est cylindrus metallicus perforatus *g*, per cujus foramen chorda ex intestinis animalium contorta trajicitur. Hæc chorda intra campanam circum brachium ligneum *ef* (*Fig. 6.*) circumligatur; & fibula, quam annexam habet, laminæ curvatæ elasticæ in fine perforatæ *rft* innectitur. Extra campanam chorda per vesicam suillam utrinque apertam transmittitur. Altera pars vesicæ circa tubulum metallicum *g*, in quo extrinsecus sulculi circumducti sunt, circumligatur, filoque cannabino adstringitur; altera vero *u* inter duos nodos in chorda nexos arcte colligatur. Vesica madefactione ita paratur, ut, postquam intrinsecus linteo deterfa fuit, distrahi contrahique se facile patiatur. Extra vesicam certa pars chordæ *ux* eminet, qua arrepta & tracta vas vitreum sub campana agitari terique potest.

§ 16. In vasculo quadrato ex lamina ferrea confecto  $\alpha\beta\gamma\delta$  (*Fig. 6, 7, 8.*), quod vel in reti serico supra vas vitreum cavumque *abcd* (*Fig. 8.*) extenso, vel in resina colophonia, vel lacca signatoria positum est, ferreumque stilum  $\gamma\epsilon$  versus pulvinar protensum sibi annexum habet, tenues auri particulæ collocantur. Mobili cylindro metallico,  $\zeta\eta$ , qui per medium campanæ collum protrudi potest, transverse annexum est filum ferreum  $\eta\vartheta$ , duas aut tres lineas distans a particulis auri. Hæ versus illud affiliunt, simulac

simulac vas vitreum, aëre ex campana educto, agitur & pulvinari atteritur.

§ 17. In altero campanæ latere perforato  $\lambda$  tubulus vitreus infixus est, per quem filum ferreum  $x\lambda\delta$  ad medium vas vitreum pertingit, parvo admodum inter vas & filum interjecto intervallo. Tubulus pariter ac filum liquefacta lacca signatoria ita firmanitur, ut nullus aer penetrare valeat. Qui ut omnino arceatur, cylindrus mobilis  $\zeta\eta$ , ubi collum campanæ attingit, sebo circumfunditur. Tracta chorda  $xug$ , filum ex agitato tritoque vase electricitatem non solum concipit, sed etiam per tubulum vitreum liquatione obturatum propagat, & cum corporibus in serico positis, quæ forinsecus filum ferreum in loco  $x$  attingunt, ita communicat, ut metalla in tenebris scintillulas electricas emittant, appropinquantibus corporibus electricitate vacuis.

§ 18. Ita etiam electricitas forinsecus excitata cum filo illo ferreo communicatur, & per tubulum obturatum pervadit, & in fine fili intra campanam lucem in tenebris effundit, ac tenues auri particulas in vasculo ferreo collocatas concitat.

## V.

### *Usus Machinæ TAB. III. Fig. 4. descriptæ.*

§ 19. **I**Nter duas columnas anticas  $ab$  &  $cd$  vasa vitrea vel globi vitrei  $e$  &  $f$  suspenduntur, & columnæ tertiæ posticæ foramini superno lamina elastica  $ik$  inditur, & lateri rota adjungitur. Laminæ elasticæ in  $k$  annexa chorda ex intestinis animalium confecta circum longiora vasorum brachia circumligatur, & asserculo mobili  $blmn$  annectitur. Ita vasa vitrea more tornatorum agitari possunt.



§ 20. Si autem vas vel globus rotari debeat, funis *opqr* circum rotam & sulcos ligneos vasorum aut globorum circumducitur, qui ope cochleæ in parte machinæ postica applicatæ & tendi potest & remitti.

§ 21. Columnas anticas coercent & firmant duo juga, ex quibus duo cylindri perforati eminent, quorum postico parva columella infigitur, in qua duo rursus cylindruli corio cervino cum subiectis pilis obducti cochleis firmantur; antico autem instrumentum, in quo fila serica extensa sunt, quibus tubus ferreus cum duobus brachiis alligatur. Hunc tubum homines apprehendunt, qui retibus sericis insistentes electricitatem nancisci cupiunt. Tubo illi si inditur ensis, cujus capulum ex filo serico pendet; ex ejus umbone, excitata electricitate, scintillæ electricæ profiliunt, spiritum vini in parvo cochleari inflammantes Sic stella\*, quam electricam (*Fig. 11.*) voco in reti serico majori ponitur, & ope fili ferrei cum tubo vitreo brachiato, annexo reti minori prope vasa vel globos, conjungitur. Simulac vasa vitrea, vel adjunctis pulvinaribus, more tornatorum agitantur, vel adhibitis manibus, rotantur; stellæ radii in tenebris lineas lucentes emittunt, & facta stellæ conversione, circulum lucentem describunt.

§ 22. Quando vasa rotantur, brachiis tubi ferrei adjunguntur argentea fila, quæ vasa attingunt. Ita flumen electricitatis continuum elicitur. Contra autem minuitur electricitas, si vasorum extremitates, facta ad modum tornatorum agitatione, adjuncta habent fila argentea, quæ vasa attingunt. Pari modo, si  
vasis

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\* *Vide Acta Germanic. or The Literary Memoirs of Germany.*  
Vol. II. p. 123.

vasis rotatis pulvinaria loco manuum applicantur,  
electricitas decrefcit.

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XIX. *A Description of a Machine to blow  
Fire by the Fall of Water ; by James Stir-  
ling, F. R. S.*

*See TAB. I. Fig. 6.*

*Read March 21.  
1744-5.*

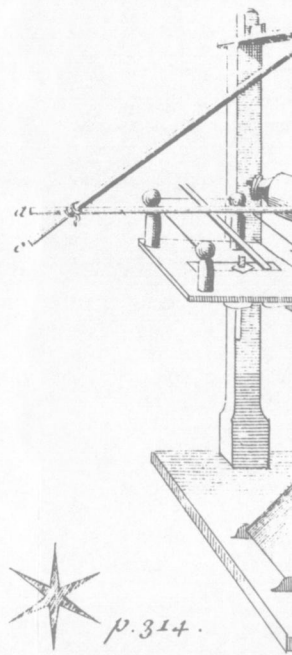
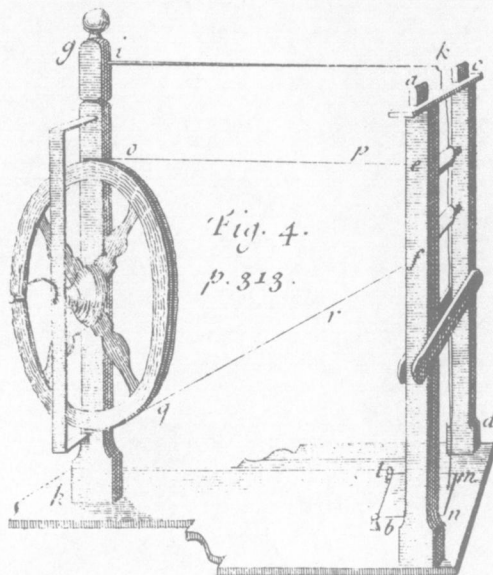
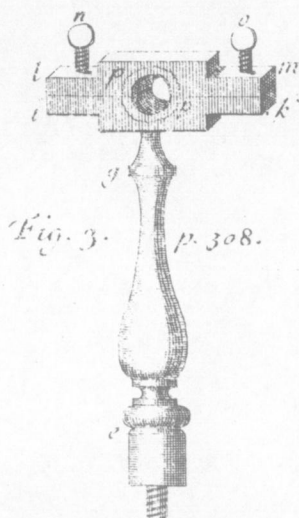
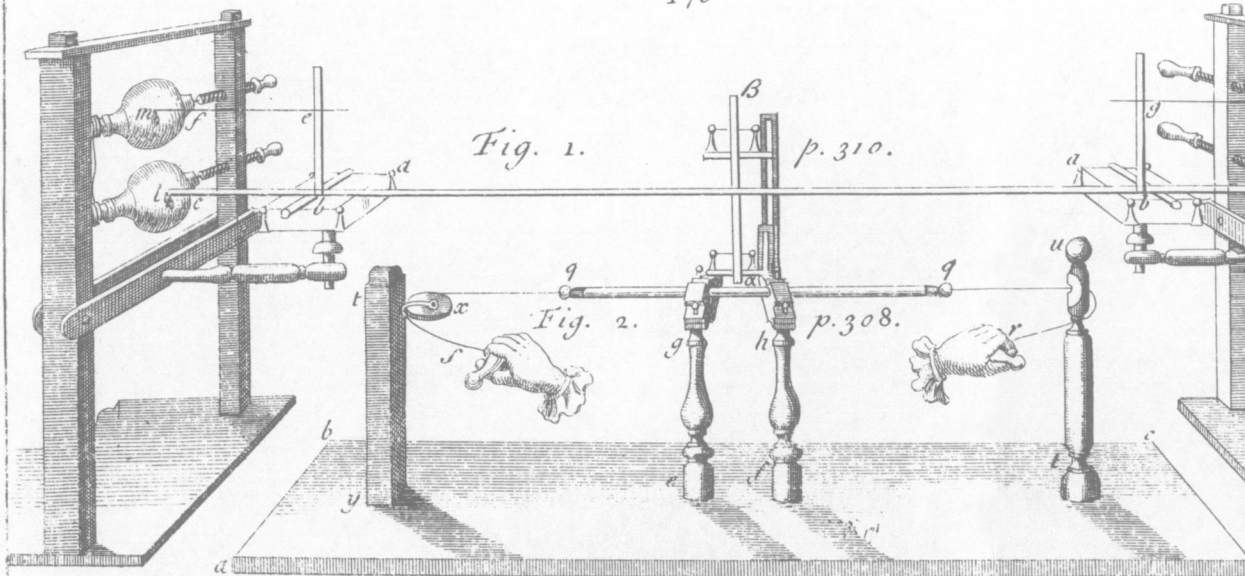
*ABCD* is a Pit dug in the Ground, whose Surface is higher at *D* than on the other Side at *A*. The Bottom *BC* is strongly ramm'd with Clay, upon which are laid thin fawen Deals.

In this Pit is fixed a Tub *GHKI* without a Bottom, having a Hole *I* at the lower Part of the Side, and all round the Tub is ramm'd with Clay, except at the Hole *I*.

In the middle of the upper End of the Tub is fixed a Pipe *PQRS*; at the higher End of which are four Holes pointing downwards, whereof two are represented by *S* and *R*.

*SRTU* is a Funnel fixed on the Top of the Pipe, with a Throat *XZ* narrower than the Bore of the Pipe. In the upper End of the Tub towards one Side is fixed a crooked Pipe at *LM*, tapering to the End at *N*. It is made of Wood so far as *O*, but from *O* to *N* of Iron, the Fire being supposed at *N*. *EF* is the Surface of a plain Stone, railed up in the middle of the Tub, directly under the Pipe *PQRS*.

The



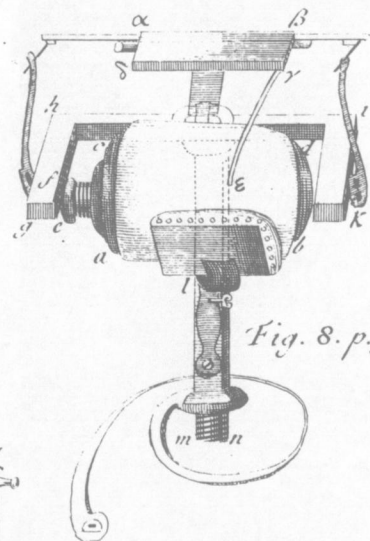
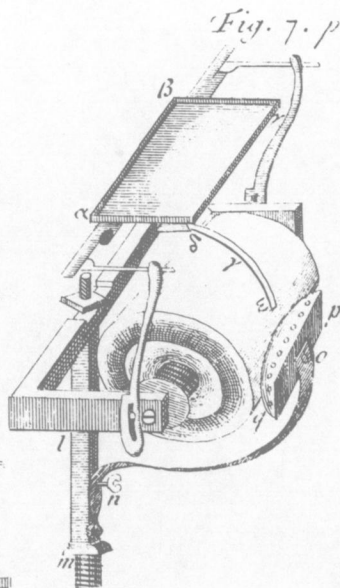
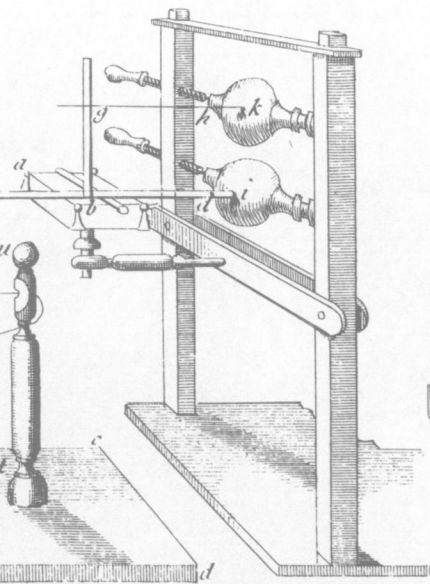


Fig. 8. p. 314.

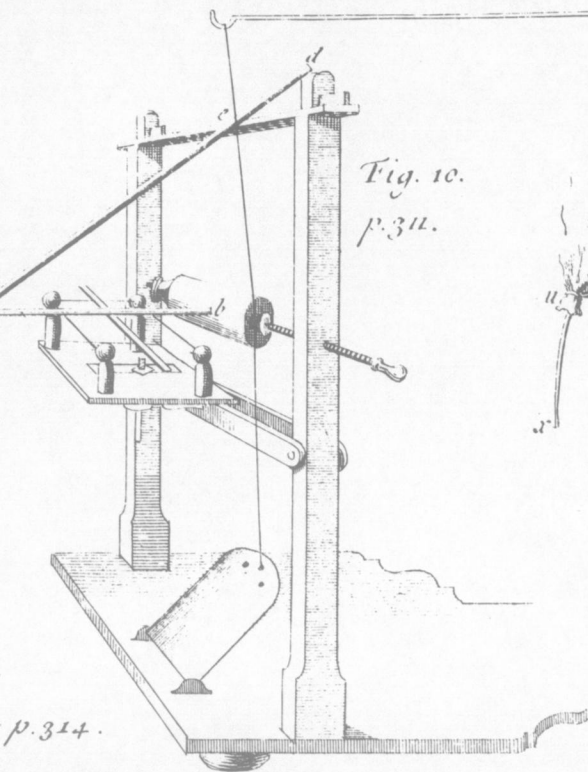


Fig. 10.  
p. 314.

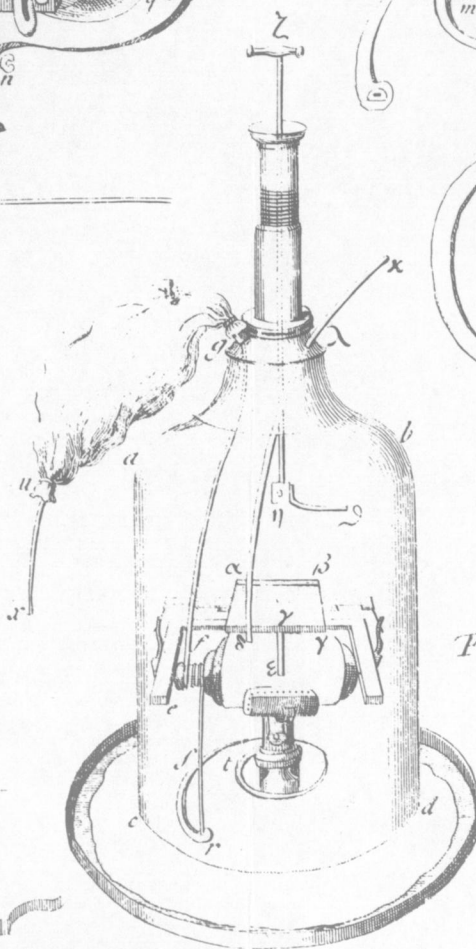


Fig. 6. p. 312.



Fig. 9. p. 312.